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WATER SUPPLY OUTLOOK FOR MONTANA

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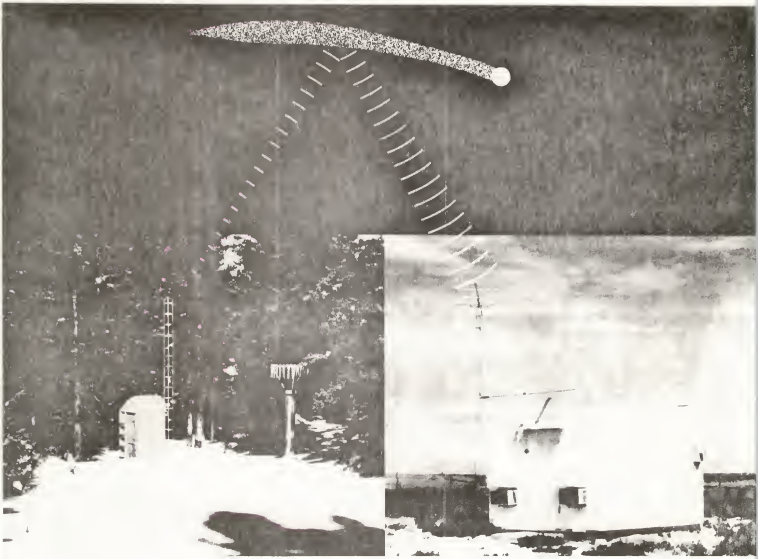

U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with

MONTANA AGRICULTURAL EXPERIMENT STATION

OCTOBER 1, 1978

Data included in this report were obtained by the agencies named above in cooperation with Federal, State and private organizations listed inside the back cover of this report.

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the some location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

COVER PHOTO: SOME OF THE DATA IN THIS REPORT HAVE BEEN RECEIVED THROUGH THE SOIL CONSERVATION SERVICE'S NEW SNOTEL SYSTEM WHICH TRANSMITS INFORMATION VIA THE SPACE AGED METEOR BURST METHOD FROM DATA SITES TO MASTER STATIONS LIKE THESE.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 510, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	Room 129, 2221 East Northern Lights Blvd., Anchorage, Alaska 99504
Arizona	Room 3008, Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P.O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1220 S.W. Third Ave., Portland, Oregon 97204
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82602

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P.O. Box 388, Sacramento, California 95802 --- for British Columbia by the Ministry of the Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia V8V 1X5 --- for Yukon Territory by the Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory Y1A 3V1 --- and for Alberta, Saskatchewan, and N.W.T. by the Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta T3C 1A6.

U.S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE
CONSERVATION OF WATER BEGINS WITH THE SNOW SURVEY

USDA-SCS-PORTLAND OR 1977

WATER SUPPLY OUTLOOK FOR MONTANA

and

FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

Issued by

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In Cooperation with

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SOIL CONSERVATION SERVICE
P.O. Box 98
Bozeman, Montana 59715

USDA-SCS-PORTLAND, OR 1976 M7-L-22024 R

NOTICE

THE FORMAT FOR THE MONTANA WATER SUPPLY OUTLOOK CHANGED THIS PAST WINTER. THE NEWSPAPER-STYLE REPORT HAS REPLACED THE BOOK-STYLE REPORT.

SIMPLY STATED, THE NEWSPAPER REPORT COSTS LESS FOR PRINTING, CAN BE PRINTED AND DISTRIBUTED IN A SHORTER TIME, AND IS EASIER TO PREPARE.

THE MAIN OBJECTION TO THIS STYLE REPORT APPEARS TO BE THE PROBLEM OF FILING THESE REPORTS FOR FUTURE REFERENCE. TO HELP THOSE WHO KEEP BASIC SNOW DATA WE PLAN TO PREPARE A BASIC DATA SUMMARY. CONTENT WILL BE CONFINED TO BASIC DATA ON SNOW COURSES, SNOW PILLOWS AND RELATED MEASUREMENTS.

THE 1978 BASIC DATA SUMMARY IS IN THE PROCESS OF BEING PREPARED AND WILL NOT BE AVAILABLE UNTIL LATER. ANYONE NEEDING THIS DATA PRIOR TO RECEIPT OF THE PUBLICATION SHOULD IDENTIFY THEIR SPECIFIC NEED TO THE SNOW SURVEY UNIT, P. O. BOX 98, BOZEMAN, MONTANA 59715.

THANK YOU FOR BEARING WITH US DURING THESE PRINTING CHANGES.

WATER SUPPLY CONDITIONS
April through September 1978

Most headwater areas started the spring season with near average snowpack in higher elevations and below average snow in the lower elevations. Spring temperatures warmed gradually and most streams carried snowmelt runoff with little channel overflow. Heavy rain in south-central and southeastern Montana and northeastern Wyoming did cause extensive flooding, primarily in the Tongue, Powder, and Big Horn River drainages.

Streamflow in most streams held up well through the summer irrigation period.

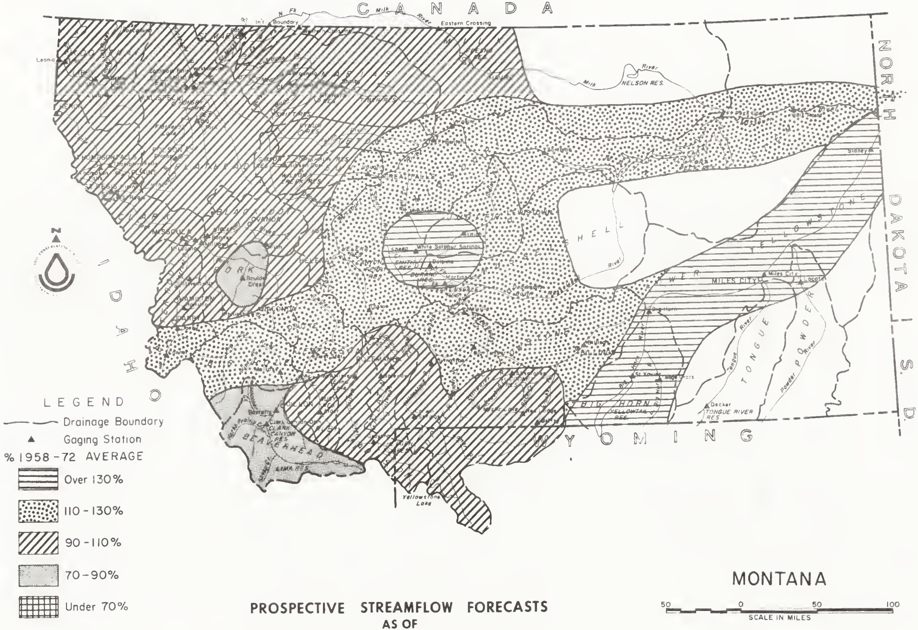
Most areas west of the divide had April through September streamflow in the range of 90 to 100 percent of average. A small portion of the Bitterroot and Upper Clark Fork headwaters had above average runoff. The Philipsburg-Anaconda-Drummond area had some streams with below average runoff.

East of the divide, the Beaverhead River showed below average runoff. Most other drainages in the Missouri headwaters showed average or above average runoff. Above average flows were recorded from streams in central Montana.

The Yellowstone River basin showed above average streamflow for almost all drainages. Most headwater streams above Billings had 5 to 25 percent more runoff than average. The Big Horn River below Yellowtail Dam and smaller drainages flowing into the Big Horn and Yellowstone River below the Big Horn had runoff greater

than 140 percent of average.

Heavy Fall moisture has occurred over various areas of the state with snowfalls of one to two feet common in the southern mountains. Current warm weather has melted most new snowfall and only the highest elevations show any remaining snow accumulation. These rains and snowmelt have added moisture to the soil.



PROSPECTIVE STREAMFLOW FORECASTS
AS OF

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

M7-O-21138A-L

1978 SNOW COVER COMPARISONS - PERCENT AVERAGE

1958-1972 Averages

Drainage	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1
Kootenai	128	94	92	77	82
Flathead	131	105	104	92	91
Upper Clark Fork	153	122	108	91	83
Lower Clark Fork	144	108	99	85	82
Bitterroot	192	134	120	103	98
Jefferson	139	112	122	107	103
Madison	129	120	128	108	104
Gallatin	131	121	124	107	100
Missouri Main-Stem	156	131	125	112	102
Judith-Musselshell	167	134	141	121	100
Marias-Teton-Sun	121	106	105	87	84
Milk	165	133	127	105	72
Yellowstone (ab Big Horn)	153	127	128	111	101
Little Big Horn	-	127	129	102	105
St. Mary's	114	103	93	71	67

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH September

Basin or Stream	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average
COLUMBIA RIVER BASIN					
Kootenai	Koocanusa	5,694.0	5,530.0	3,733.0	-
Flathead	Hungry Horse	3,428.0	3,440.0	2,366.0	3,293.0
	Flathead Lake	1,791.0	1,712.0	1,728.0	1,738.0
	Camas (4)	45.2	16.7	3.2	21.4
	Mission Valley (8)	100.3	66.6	26.7	22.7
Clark Fork	Georgetown Lake	31.0	30.7	27.7	28.4
	Lower Willow Creek	4.9	.8	.1	1.2
	Nevada Creek	12.8	-	-	4.8
	Noxon Rapids	334.6	327.5	315.3	323.7
Bitterroot	Como	34.9	6.1	.8	1.7
	Painted Rocks	31.7	27.3	18.6	26.5
MISSOURI RIVER BASIN					
Beaverhead	Clark Canyon	257.2	137.7	114.9	125.6
	Lima	84.0	-	33.2	27.1
Ruby	Ruby	38.8	13.2	-	10.8
Madison	Hebgen Lake	377.5	339.7	333.2	315.9
	Ennis Lake	41.0	38.1	38.8	35.4
Gallatin	Middle Creek	8.0	4.2	2.9	2.9
Missouri	Canyon Ferry	2,043.0	1,472.0	1,786.0	1,742.0
	Hauser & Helena	61.9	61.9	60.7	58.7
	Lake Helena	10.4	10.5	10.0	10.3
	Holter Lake	81.9	80.3	80.5	75.4
	Fort Peck Lake	18,910.0	18,420.0	14,980.0	14,550.0
Smith	Smith River	10.6	-	6.6	4.8
	Newlan Creek	12.4	11.6	3.1	-
Musselshell	Bair	7.0	-	3.0	3.0
	Martinsdale	23.1	-	10.4	7.8
	Deadman's Basin	72.2	-	15.1	32.5
Sun	Gibson	99.0	49.1	2.2	31.0
	Willow Creek	32.2	25.7	11.9	17.7
	Pishkun	32.0	19.8	16.8	16.4
Marias	Lower Two Medicine	11.9	11.8	-	-
	Four Horns	19.2	13.1	-	-
	Swift	30.0	12.0	1.4	13.9
Milk	Lake Frances	111.9	94.0	29.8	78.9
	Elwell (Tiber)	1,347.0	629.3	532.5	642.3
	Beaver Creek	3.5	2.1	1.6	-
	Fresno	127.2	85.7	23.4	66.2
	Nelson	66.8	49.8	6.5	43.4
	Lake Sherburne	66.2	16.7	12.5	6.4
Yellowstone	Mystic Lake	21.0	19.9	17.9	20.1
	Cooney	27.4	14.6	3.5	12.2
	Tongue River	68.0	20.1	20.1	24.1
	Big Horn Lake	1,356.0	1,042.0	931.1	977.9

Average based on 1958-72 period.

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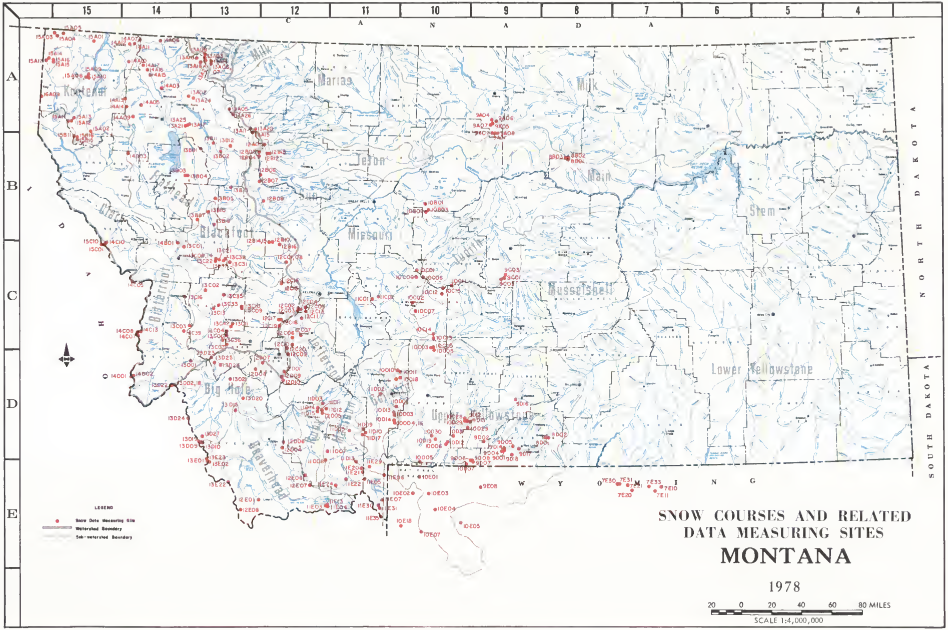

SNOW COURSES AND RELATED DATA MEASURING SITES

MONTANA

1978

INDEX to MONTANA SNOW COURSES and DATA SITES

SNOW COURSES

COLUMBIA RIVER BASIN

Drainage Basin & Snow Course	Number	Elev.	Sec.	Twp.	Range	Sensors in Addition to Snow Course 1/	Measure Dates 2/	Meas By 3/
KOOTENAI RIVER								
Bald Eagle Peak	15A11	5700	6	27N	31W		3,4,5,5½,6	1
Banfield Mountain	15A08	5600	4	32N	30W	S,P,T,W	2,3,4,5,5½,6	1
Baree Creek	15B11	5500	36	26N	26W		3,4,5,5½	2
Baree Midway	15B16	4600	31	26N	30W		3,4,5,5½	2
Baree Trail	15B15	3800	5	25N	30W	M	3,4,5,5½	2
Bristow Creek	15A10	3900	2	32N	30W		2,3,4,5,5½,6	1
Brush Creek Timber	14A13	5000	12	30N	26W		3,4,5,	1,2
Cedar Grove	15A13	4100	35	28N	31W		2,3,4,5,5½,6	1
Davis Creek	15A04	5400	20	37N	33W		2,3,4,5,5½,6	1
Fourth of July	15A15	3450	19	34N	33W		1,2,3,4,5,5½,6	2
Friday Hill	15A16	4620	19	34N	33W		1,2,3,4,5,5½,6	2
Garver Creek	15A05	4250	18	37N	32W	S,P,T,W	2,3,4,5,5½,6	1
*Grave Creek	14A11	4300	1	36N	25W	S,P,T,	3,4,5,5½,6	1
Hawkins Lake	15A03	6450	18	37N	33W	S,P,T,W,	2,3,4,5,5½,6	1
Keeler Creek	16A08	3300	25	30N	35W		3,4,5	1
Lost Soul	15A09	4800	31	33N	29W		2,3,4,5,5½,6	1
Murphy Lake R.S.	14A10	3000	5	34N	25W	M,NSC	Monthly	2
Newton Mountain	15A17	5600	23	34N	34W		1,2,3,4,5,5½,6	2
Poorman Creek	15A12	5100	5	27N	31W	S,P,T,W	2,3,4,5,5½,6	1
Raven	15A02	3050	2	26N	29W	M,NSC	Monthly	2
Red Mountain	15A01	6000	4	36N	29W		3,4,5,5½,6	2
Red Top	15A14	5200	14	34N	34W		1,2,3,4,5,5½,6	2
*Stahl Peak	14A12	6050	5	36N	25W	S,P,T	3,4,5,5½,6	1
Weasel Divide	14A07	5450	20	37N	24W		3,4,5,5½,6	1
FLATHEAD RIVER								
Baaso Peak	14BD3	5150	11	24N	25W		3,4,5	5
Beaver Lake	13A11	5900	31	28N	11W		3,4,5	1
Big Creek	13B03	6750	7	22N	18W		3,4,5, 6	1,5
Camp Misery	13A17	6400	30	28N	18W		3,4,5	1,2
Chicken Creek	14A15	4060	14	33N	23W	P	1,2,3,4,5,5½,6	15
Desert Mountain	13A02	5600	24	31N	19W	M	1,2,3,4,5, 6	1,2
Emery Creek	13A24	4350	20	31N	18W	S,P,T,	3,4,5	1
Fatty Creek	13BD4	5500	8	22N	18W		3,4,5, 6	1,5
*Flattop Mountain	13A19	6300	12	35N	18W	S,P,T,	4	1,6
Griffin Creek Divide	14A09	5150	11	28N	25W		3,4,5	5
Gunsight Lake	13B12	6300	30	26N	13W		3,4,5	1
Hand Creek	14A14	5035	6	29N	25W	S,P,T	3,4,5	1,2
Hell Roaring Divide	14A03	5770	35	32N	22W		1,2,3,4,5,5½,6	2
Herrig Junction	14A16	4850	19	34N	23W	P	1,2,3,4,5,5½,6	15
Holbrook	13B13	4530	18	21N	13W	A	1,2,3,4	1
Kishenehn	14A06	3890	14	37N	22W		3,4	6
Logan Creek	14A05	4300	34	30N	24W		3,4,5	1,2
Mineral Creek	13A16	4000	29	35N	17W		3,4,5	6
Noisy Basin	13A25	6040	25	28N	19W	S,P,T,	3,4,5	1,2
Noisy Creek	13A21	3600	35	28N	19W		3,4,5	1,2
North Fork Jocko	13B07	6330	3	17N	17W		3,4,5,5½,6	1,5
Spotted Bear Mountain	13B02	7000	23	25N	15W	A	1,2,3,4,5	1
Stryker Basin	14A17	6190	26	34N	24W	P	1,2,3,4,5,5½,6	15
Trinkus Lake	13B01	6100	9	25N	17W		3,4,5	1
Twin Creeks	13B11	3580	25	26N	16W	A	1,2,3,4,5	1
Upper Holland Lake	13B05	6200	28	20N	15W		3,4,5	1
CLARK FORK RIVER								
Basin Creek	12D09	7180	31	1N	7W	P	1,2,3,4,5,5½	14
Black Mountain	12C19	7750	34	7N	8W		3,4,5	2
*Black Pine	13C13	7100	26	8N	15W	S,P,T,M	1,2,3,4,5,5½,6	1
*Combination	13C33	5600	7	8N	14W	S,P,T	1,2,3,4,5,5½,6.	1
*Copper Bottom	12B16	5200	15	15N	8W	S,P,T	3,4,5	1,2
*Copper Camp	12B14	6950	3	15N	9W	S,P,T	3,4,5	1,2
Copper Creek	12B10	5700	1	15N	9W		3,4,5	1,2
Copper Lake Creek	12B15	6100	3	15N	9W		3,4,5	1,2
Cottonwood Creek	12C17	6400	14	7N	8N		3,4	2
Coyote Hill	13B10	4200	12	18N	16W		1,2,3,4,5	1,2
Discovery Basin	13C42	7050	21	6N	13W		1,2,3,4,5,5½	1
Dix Hill	12C15	6400	24	11N	8W	P	1,2,3,4,5	11
El Dorado Mine	13C09	7800	23	8N	12W		3,4	1
Fred Burr Pass	13C11	8000	12	6N	13W		3,4,5	1
Gold Creek Lake	13C10	7200	14	8N	12W		3,4	1
Heart Lake Trail	14C10	4800	11	14N	27W		1,2,3,4,5,5½,6	1
Hoodoo Basin	15C10	6000	17	14N	27W	S,P,T,	1,2,3,4,5,5½,6	1
Hoodoo Creek	15C01	5900	16	14N	27W		1,2,3,4,5,5½,6	1
Intergaard	13C04	6450	6	5N	13W		2,3,4,5	4
Lower Willow Creek	13C35	4740	3	9N	14W	P,NSC	Monthly	1
Lubrecht Forest	13C14	4100	11	13N	15W	M,NSC	Monthly	8
Lubrecht Flume	13C38	4680	13	13N	14W	S,P,T	1,2,3,4,5	8
Lubrecht Forest No.3	13C21	5450	19	13N	14W		1,2,3,4,5	8
Lubrecht Forest No 4	13C22	4650	23	13N	15W		1,2,3,4,5	8
Lubrecht Forest No.6	13C08	4040	11	13N	15W		1,2,3,4,5	8
Lubrecht Hydroplot	13C37	4200	22	13N	14W		1,2,3,4,5	8
Moulton Reservoir	12C20	6800	20	4N	7W		1,2,3,4,5,5½	14
*North Fork Elk Creek	13C31	6250	20	13N	13W	S,P,T	1,2,3,4,5,5½,6	8
Ophir Park	12C16	7150	13	11N	8W		1,2,3,4,5	11
Peterson Meadows	13C36	7200	2	4N	14W	S,P.	1,2,3,4,5	2
Seeley Lake R.S.	13B19	4030	21	17N	15W	M,NSC	Monthly	2
Skalkaho Summit	13C03	7260	30	6N	17W	P,M,T	3,4,5,5½,6	1
Slide Rock Mountain	13C02	7100	35	10N	16W		3,4,5	1
Storm Lake	13C07	7780	19	4N	13W		1,2,3,4,5	2
Stuart Mill	13C06	6500	19	5N	13W		2,3,4	4
Stuart Mountain	13C01	7400	6	16N	18W		3,4,5,5½,6	8
Sugarloaf	12C18	7350	13	7N	8W		3,4	2
TV Mountain	14B01	6800	33	15N	19W		1,2,3,4,5,5½,6	8
BITTERROOT RIVER								
Ambrose	13C16	6480	28	9N	18W		3,4,5	1
Daly Creek	13C39	5780	16	5N	18W	P,S,T	3,4,5	1
East Fork R S	13D01	5400	16	2N	17W		3,4	1
Gibbons Pass	13D02	7100	4	2S	19W	M	1,2,3,4,5,5½,6	1,3
Lolo Pass	14C05	5250	11	10N	24W	M	1,2,3,4,5	1,2
Lost Horse	14C07	5940	5	4N	23W		3,4,5,5½,6	1
Nez Perce Camp	14D02	5580	19	1S	23W	S,P,T,	3,4,5	1
Nez Perce Pass	14D01	6570	25	1S	24W		3,4,5	1
*Saddle Mountain	13D22	7940	5	2S	19W	S,P,T,	1,2,3,4,5,5½,6	1
*Twelvemile Creek	14C13	5600	34	5N	23W	S,P,T,	1,2,3,4,5,5½,6	1
*Twin Lakes	14C08	6510	32	5N	23W	S,P,T,	1,2,3,4,5,5½,6	1

HUDSON BAY BASIN

Drainage Basin & Snow Course	Number	Elev.	Sec.	Twp.	Range	Sensors in Addition to Snow Course 1/	Measure Dates 2/	Meas By 3/
ST. MARY RIVER								
Iceberg Lake No. 3	13A03	5600	1	35N	17W		5	3,9
Josephine Lower No.9	13A14	4900	22	35N	16W		5	3,9
Many Glacier	13A27	4960	10	35N	17W	S,P,T	1,4,5	1,6
Mount Allen No.7	13A07	5700	27	35N	16W		5	3,9
Piegan Pass No 6	13A06	5500	27	35N	16W		5	3,9
Ptarmigan No 8	13A08	5800	36	36N	17W		5	3,9

MISSOURI RIVER BASIN

Drainage Basin & Snow Course	Number	Elev.	Sec.	Twp.	Range	Sensors in Addition to Snow Course 1/	Measure Dates 2/	Meas. By 3/
BEAVERHEAD RIVER								
Beagle Springs	12E08	8850	6	16S	11W	S,P,T,	3,4,5	1
Bloody Dick	13D10	7600	12	8S	16W	S,P,T,	3,4,5	1
Carter Creek	12D04	7400	22	8S	7W		2,3,4	11
Christensen Ranch	12D06	6000	34	7S	7W	P,NSC	Monthly	11
Dad Creek Lake	13E22	8400	24	12S	13W		3,4,5	1
Elk Horn Springs	13D15	7800	21	4S	12W		3,4,5	3
Gold Stone	13D09	8100	11	8S	16W		3,4,5	1
Lakeview	11E13	6700	23	14S	2W	M,NSC	Monthly	10
Lakeview Canyon	11E04	6930	26	14S	2W		1,2,3,4,5	10
Lakeview Ridge	11E03	7400	27	14S	2W	P,S,T	1,2,3,4,5	10
Lemhi Pass	13E01	7480	9	10S	15W		3,4,5	1
*Lemhi Ridge	13E23	8100	4	10S	15W	S,P,T	3,4,5	1
Trail Creek	13E02	7090	15	10S	15W		3,4,5	1
White Pine Ridge	12E01	8850	18	14S	9W		3,4,5	1
RUBY RIVER								
Branham Lakes	11D14	8850	5	4S	3W		3,4,5	1,12
Clover Meadow	11D08	8600	28	9S	2W	P	3,4,5	1
*Divide	12E07	7800	14	12S	4W	S,P,T	3,4,5	1
Middle Mill Creek	11D15	7850	17	4S	3W		3,4,5	1,12
Koch	12E06	8500	18	11S	4W		3,4,5	1
Smuggler Mine	12D05	6960	24	4S	6W		3,4,5	1,12
BIG HOLE RIVER								
Abundance Lake	13D20	8800	7	3S	11W		3,4,5	1
Bull Mountain	12D08	7500	3	1N	10W		1,2,3,4,5	2
*Calvert Creek	13D26	6450	34	2N	14W	S,P,T,	3,4,5	1
Darkhorse Lake	13D19	8600	4	8S	16W	P	3,4,5	1
Fleecer Ridge	12D07	6600	18	2N	9W		1,2,3,4,5	2
Foolhen	13D21	8280	11	1S	13W		3,4,5	1
Jahnke Lake Trail	13D27	7200	24	7S	16W		3,4,5	1
Mudd Lake	13D25	7650	24	2N	15W		3,4,5	1
Palisade Creek	13D23	8250	3	2N	15W		4,5	1
Sieg-A-Melt Lake	13D24	8750	29	5S	17W		3,4,5	1
JEFFERSON RIVER								
Barry Meadow	12C07	7000	8	5N	5W		3,4	1
Copper Mountain	12C09	7700	13	3N	7W		2,3,4,5,5½	4
Fish Creek	12D10	8000	5	1S	7W		1,2,3,4,5,5½	14
Nez Perce Creek	12C10	6500	16	4N	6W		2,3,4,5	4
Picnic Grounds	12C06	6500	21	5N	6W		2,3,4	4
Pipestone Pass	12D01	7200	10	1N	7W		1,2,3,4,5	4
*Rocker Peak	12C11	8000	17	7N	5W	S,P,T	1,2,3,4,5	1
MADISON RIVER								
*Black Bear	11E35	7950	27	15S	5E	S,P,T	1,2,3,4,5,5½,6	1,2
Call Bond	11D07	8050	21	8S	2W		3,4,5	1
Four Mile	11D12	6900	5	4S	2W	P	3,4,5	1
Hebgen Dam	11E05	6550	22	11S	3E		1,2,3,4,5	3
Jack Creek	11D05	7500	13	6S	1E		3,4	1
Lake Creek	11E22	6100	27	11S	1E		2,3,4,5	1,2
Lower Twin	11D11	7900	12	4S	3W	P,S,T,	3,4,5	1
Madison Plateau	11E31	7750	28	14S	5E	S,P	1,2,3,4,5,5½,6	1,2
North Meadow	11D03	7500	24	3S	3W		3,4,5	1
Potomageton Park	11E21	7150	33	10S	3E		3,4,5	2
Sentinel Creek	11E20	8300	17	10S	3E		3,4,5	2
*Tepee Creek	11E24	8000	15	12S	1W	S,P,T	2,3,4,5	1,2
West Yellowstone	11E07	6700	34	13S	5E	S,M,	1,2,3,4,5	1,3,6
*Whiskey Creek	11E30	6800	19	14S	5E	S,P,T	1,2,3,4,5,5½,6	2
GALLATIN RIVER								
Arch Falls	10D14	7350	3	5S	6E		1,2,3,4,5,5½,6	1
Bear Basin	11D09	8150	9	6S	3E		3,4,5	1
Big Sky	11D17	7700	30	6S	3E	P	1,2,3,4,5	1
Bridger Bowl	10D15	7250	25	1N	6E	S,P,M	1,2,3,4,5,5½,6	1
Carrot Basin	11E29	9000	18	10S	4E	S	1,2,3,4,5	2
College Site	11D02	4856	18	2S	5E	M,NSC	Weekly	7
Devils Slide	10D04	8100	14	5S	6E		1,2,3,4,5,5½,6	1
Hood Meadow	10D03	6600	22	4S	6E		1,2,3,4,5,5½,6	1
*Lick Creek	10D13	6860	10	4S	6E	S,P,T,M	1,2,3,4,5,5½,6	1
Little Park	11D10	7400	22	6S	3E		3,4,5	1
Maynard Creek	10D18	6210	19	1N	7E	S,P	1,2,3,4,5,5½,6	1
New World	10D01	6700	24	3S	6E		2,3,4	1
*Shower Falls	10D16	8100	14	5S	6E	S,P,T	1,2,3,4,5,5½,6	1
Taylor Peaks	11D13	8500	26	9S	2E	S,P	4	1
Twenty-One Mile	11E06	7150	1	11S	5E	M	1,2,3,4,5	3
MISSOURI RIVER MAIN STEM								
Big Coulee	10B03	5100	10	19N	9E		1,2,3,4,5	1,12
Boulder Mountain	11C01	7950	1	9N	5E	S,P,T	3,4,5	1
Chessman Reservoir	12C05	6200	2	8N	5W		1,2,3,4,5	3
*Deadman Creek	10C09	6450	23	12N	8E	S,P,T	1,2,3,4,5,5½,6	1
Elk Peak	10C07	8000	10	8N	8E		3,4,5	1
*Frohner Meadows	12C13	6480	23	8N	5W	S,P,T	1,2,3,4,5	1
Grasshopper	10C02	7000	19	9N	8E		3,4,5	1
Highwood Divide	10B02	5650	16	19N	9E	P	1,2,3,4,5	1,12
Highwood Station	10B01	4600	20	20N	9E	P	1,2,3,4,5	1,12
Kings Hill	10C01	7500	34	13N	8E	M	3,4,5,5½,6	1,3
Pickfoot Creek	11C02	6650	31	10N	4E	S,P,T	3,4,5	1
Stemple Pass	12C01	6600	16	13N	7W	M	3,4,5	1,3
Ten Mile Lower	12C02	6600	12	8N	6W		1,2,3,4,5	3
Ten Mile Middle	12C03	6800	13	8N	6W		1,2,3,4,5	3
Ten Mile Upper	12C04	8000	19	8N	5W		1,2,3,4,5	3
TETON-MARIAS-SUN RIVERS								
Badger Pass	13A15	6900	4	27N	11W	A,P,S,T	1,2,3,4,5	1
Blue Lake	13A20	5900	25	28N	11W	A	1,2,3,4,5	1
Cabin Creek	12B06	5200	33	23N	10W		3,4,5	2
Five-Bull	12B09	5700	25	20N	10W		3,4,5	1
Freight Creek	12A01	6000	13	26N	10W		3,4,5	1
Goat Mountain	12B07	7000	20	22N	10W		3,4	2,3
Marias Pass	13A05	5250	31	30N	13W	M	1,2,3,4,5	3,6
*Mount Lockhart	12B12	6400	18	25N	9W	S,P,T	1,2,3,4,5,5½,6	2
Pike Creek	13A26	5930	5	29N	13W	S,P,T	3,4,5	1
*Waldron	12B13	5600	17	25N	9W	S,P,T	1,2,3,4,5,5½,6	2
Wrong Creek	12B04	5700	32	25N	10W		3,4,5	2
Wrong Ridge	12B03	6800	17	25N	10W		3,4,5	2
JUDITH RIVER								
Big Snowy	9C05	7150	25	12N	17E		3,4,5	1
Crystal Lake	9C01	6100	19	12N	18E	P,S,T	3,4,5	1
Rock Creek	9C03	5600	7	12N	18E		3,4,5	1
*Spur Park	10C06	8100	20	12N	9E	S,P,T	1,2,3,4,5,5½,6	1
MUSSELSHELL RIVER								
Daisy Peak	10C15	7600	34	11N	11E	P	3,4,5	2
Eagle Creek	10C13	7000	2	5N	10E		3,4,5	2
Forest Lake	10C14	6400	26	6N	10E		3,4,5	2
Haymaker	10C11	8050	16	11N	12E		3,4,5	2
Johnson Park	10C12	6450	16	10N	11E		3,4,5	2
MILK RIVER								
Beaver Creek	9A05	3950	21	29N	16E	M,NSC	Monthly	1,7
Bear Paw Ski Area	9A02	5200	21	28N	16E	P	1,2,3,4,5	1,7
Boxelder Creek	9A08	5100	24	28N	16E	P	1,2,3,4,5	1,7
King Creek Saddle	8B02	4550	10	25N	24E		1,2,3,4,5	5
King Springs	8B03	4150	9	25N	24E		1,2,3,4,5	5
Kiwanis Camp	9A04	3720	9	29N	16E	P,W,T	1,2,3,4,5	1,7
Mission Mountain	8B01	5050	15	25N	24E	P	1,2,3,4,5	5
Rocky Boy	9A01	4700	22	28N	16E	S,P,M	1,2,3,4,5	1,7
Sucker Creek	9A06	3960	11	29N	16E	P	1,2,3,4,5	1,7
Taylor Road	9A07	4080	19	29N	16E	P	1,2,3,4,5	1,7
UPPER YELLOWSTONE RIVER								
Bald Ridge	10C05	7500	11	4N	10E		3,4,5	1
Battle Ridge	10D11	6020	32	2N	7E	M	1,2,3,4,5	1
Bote Sota	9D14	7750	35	7S	18E		3,4,5	1
Box Canyon	10D31	6700	28	6S	12E	S,P,T	3,4,5	1
Brass Monkey	10D29	9050	6	5S	14E	P,NSC	Seasonally	11
Camp Senia	9D01	7890	2	8S	18E		3,4,5,5½,6	1
*Cole Creek	9D16	7850	26	2S	19E	S,P,T	1,2,3,4,5,5½,6	1,2
Colley Creek	10D30	6300	34	6S	10E	P	3,4,5	1
Cooke Station	9D07	8150	19	9S	15E		3,4,5,5½,6	1,2
Crevice Mountain	10D05	8400	22	9S	9E		3,4	2
*Fisher Creek	9D06	9100	11	9S	14E	S,P,T	1,2,3,4,5,5½,6	1,2
Grizzley Peak	9D05	8400	26	7S	19E		1,2,3,4,5	1,2
Independence	10D06	7850	21	7S	12E		3,4,5	1
Mill Creek	10D19	7500	6	7S	11E	P	3,4,5	2
Monument Peak	10D12	8800	16	7S	12E	S,P,T	3,4,5	1
*Northeast Entrance	10D07	7400	33	9S	14E	S,P,M,T	1,2,3,4,5,5½,6	1,6
Picket Pin Lower	9D13	6200	1	5S	14E	P	1,2,3,4,5	13
Picket Pin Middle	9D12	7250	3	5S	14E		1,2,3,4,5	13
Picket Pin Upper	10D28	8100	32	4S	14E	P	1,2,3,4,5	13
PMC Dryland	8D02	3700	35	6S	23E	M,NSC	Monthly	1
PMC Headquarters	8D01	3656	34	6S	23E	P,W,T,NSC	Daily	1
Porcupine	10C03	6500	10	4N	10E	S,P,T	3,4,5	1
Sacajawea	10D10	6550	36	2N	6E		3,4,5	1
*Silver Run	9D18	6630	11	8S	19E	S,P,T	3,4,5	1
South Fork Shields	10C08	8100	13	4N	10E		3,4,5	1
Timberline Creek	9D04	8850	10	8S	18E		3,4,5,5½,6	1
West Rosebud	9D02	7500	9	7S	16E		3,4	4
White Mill	9D08	8700	18	9S	15E	S,P,T	3,4,5,5½,6	1,2
Willow Creek	9D17	6500	31	7S	20E		1,2,3,4,5	1,2

LEGEND

* SNOTEL site—data transmitted daily by telemetry

1/ Blank refers to snow course only at site
- S = snow pillow also
- P = precipitation gage also
- M = soil moisture gage also
- T = max-min temperature also
- W = wind run also
- A = aerial marker also
- NSC = no snow course at site

2/ Numerals 1,2,3,4,5,5½,6 refer to snow course or aerial marker measurements on January 1, February 1, March 1, April 1, May 1, May 15, and June 1. Most snow pillows, temperature, and wind run are daily readings, most precipitation gages and soil moisture are read monthly.

3/ Numerals refer to agency making the snow surveys as follows:

1.	Soil Conservation Service	8.	University of Montana School of Forestry
2.	Forest Service	9	Department of Energy, Mines and Resources
3	Geological Survey	10.	Bureau of Sports Fisheries and Wildlife
4	Montana Power Company	11.	Private Cooperator
5.	Bureau of Indian Affairs	12	Montana Association of Conservation Districts
6.	National Park Service	13.	Montana Department of Fish and Game
7.	MSU Agricultural Experiment Station	14	Butte Water Company
		15.	State Forester

Agencies and Organizations Cooperating in Montana Snow Surveys

GOVERNMENT AGENCIES

Canada:

Water Survey of Canada, Calgary, Department of the Environment
Water Resources Service, Department of Lands, Forests and Water Resources, British Columbia
Alberta Environment, Edmonton, Alberta

Federal:

Department of the Army
    Corps of Engineers
U.S. Department of Agriculture
    Forest Service
    Soil Conservation Service
U.S. Department of Commerce
    NOAA, National Weather Service
U.S. Department of the Interior
    Bonneville Power Administration
    Bureau of Indian Affairs
    Bureau of Reclamation
    Fish and Wildlife Service
    Geological Survey
    National Park Service

STATE

Montana Conservation Districts
Montana Department of Fish and Game
Montana Department of Natural Resources and Conservation
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry
DNRC - State Forester

PRIVATE

Montana Power Company
Butte Water Company
The Anaconda Company

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

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